

## 299-E13-56 (A5871) Log Data Report

### Borehole Information:

<b>Borehole:</b> 299-E13-56 (A5871)			<b>Site:</b> 216-B-25-Trench			
<b>Coordinates (WA St Plane)</b>		<b>GWL<sup>1</sup> (ft):</b> None		<b>GWL Date:</b> None		
<b>North (m)</b>	<b>East (m)</b>	<b>Drill Date</b>	<b>Ground Level Elevation (ft)</b>	<b>Total Depth (ft)</b>	<b>Type</b>	
134181.672	573287.957	08/82	738.99	50	Cable	

### Casing Information:

<b>Casing Type</b>	<b>Stickup (ft)</b>	<b>Outer Diameter (in.)</b>	<b>Inside Diameter (in.)</b>	<b>Thickness (in.)</b>	<b>Top (ft)</b>	<b>Bottom (ft)</b>
Welded Steel	2.35	8 5/8	8	5/16	2.35	50

### Borehole Notes:

The logging engineer measured the 8-in. casing and stickup using a steel tape. Measurements were rounded to the nearest 1/16 in. Casing depths are derived from *Hanford Wells* (Chamness and Merz 1993) that also reports grout in the annular space outside the 8-in casing.

### Logging Equipment Information:

<b>Logging System:</b> Gamma 1E		<b>Type:</b> SGLS (70%) SN: 34TP40587A
<b>Calibration Date:</b> 10/04	<b>Calibration Reference:</b> DOE-EM/GJ713-2004	
<b>Logging Procedure:</b> MAC-HGLP 1.6.5, Rev. 0		

### Spectral Gamma Logging System (SGLS) Log Run Information:

<b>Log Run</b>	<b>1</b>	<b>2</b>	<b>3 Repeat</b>		
Date	11/02/04	11/03/04	11/03/04		
Logging Engineer	Spatz	Spatz	Spatz		
Start Depth (ft)	49.0	15.0	24.0		
Finish Depth (ft)	16.0	3.0	19.0		
Count Time (sec)	100	100	100		
Live/Real	R	R	R		
Shield (Y/N)	N	N	N		
MSA Interval (ft)	1.0	1.0	1.0		
ft/min	N/A <sup>2</sup>	N/A	N/A		
Pre-Verification	AE018CAB	AE019CAB	AE019CAB		
Start File	AE018000	AE019000	AE019013		
Finish File	AE018033	AE019012	AE019018		
Post-Verification	AE018CAA	AE020CAA	AE020CAA		
Depth Return Error	0	0	0		

<b>Log Run</b>	<b>1</b>	<b>2</b>	<b>3 Repeat</b>		
(in.)					
Comments	No fine gain adjustment.	No fine gain adjustment.	No fine gain adjustment.		

### **Logging Operation Notes:**

Logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the top of casing. A repeat section was collected in this borehole to evaluate system performance. Before logging, the borehole was swabbed and no contamination was detected.

### **Analysis Notes:**

<b>Analyst:</b>	Henwood	<b>Date:</b>	01/05/05	<b>Reference:</b>	GJO-HGLP 1.6.3, Rev. 0
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Pre-run and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met.

A casing correction for 0.3125-in.-thick casing was applied to the log data.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G1EOct04.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. Dead time corrections are applied to the data when it exceeds 6.4 percent. No correction for water was necessary.

### **Log Plot Notes:**

Separate log plots are provided for the man-made radionuclides ( $^{137}\text{Cs}$  and  $^{125}\text{Sb}$ ) detected in the borehole, naturally occurring radionuclides ( $^{40}\text{K}$ ,  $^{238}\text{U}$ ,  $^{232}\text{Th}$  [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. Repeat log sections for man-made and natural radionuclides are also included. A comparison plot of RLS data acquired in 1999 and the current SGLS data is provided.

### **Results and Interpretations:**

$^{137}\text{Cs}$  and  $^{125}\text{Sb}$  were the man-made radionuclides detected in this borehole.  $^{137}\text{Cs}$  was detected between 5 and 9 ft and between 15 ft and total depth of the borehole (50 ft); the maximum concentration was measured at approximately 110 pCi/g at 17 ft.

$^{125}\text{Sb}$  was detected between 19 and 31 ft and at a few other locations; the maximum concentration was measured at approximately 2 pCi/g at 24 ft.

The repeat sections generally indicates good agreement of the man-made and naturally occurring radionuclides.

The comparison plot of RLS and SGLS data show good agreement suggesting no changes since 1999.

## **References:**

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNL-8800, Pacific Northwest Laboratory, Richland, Washington.

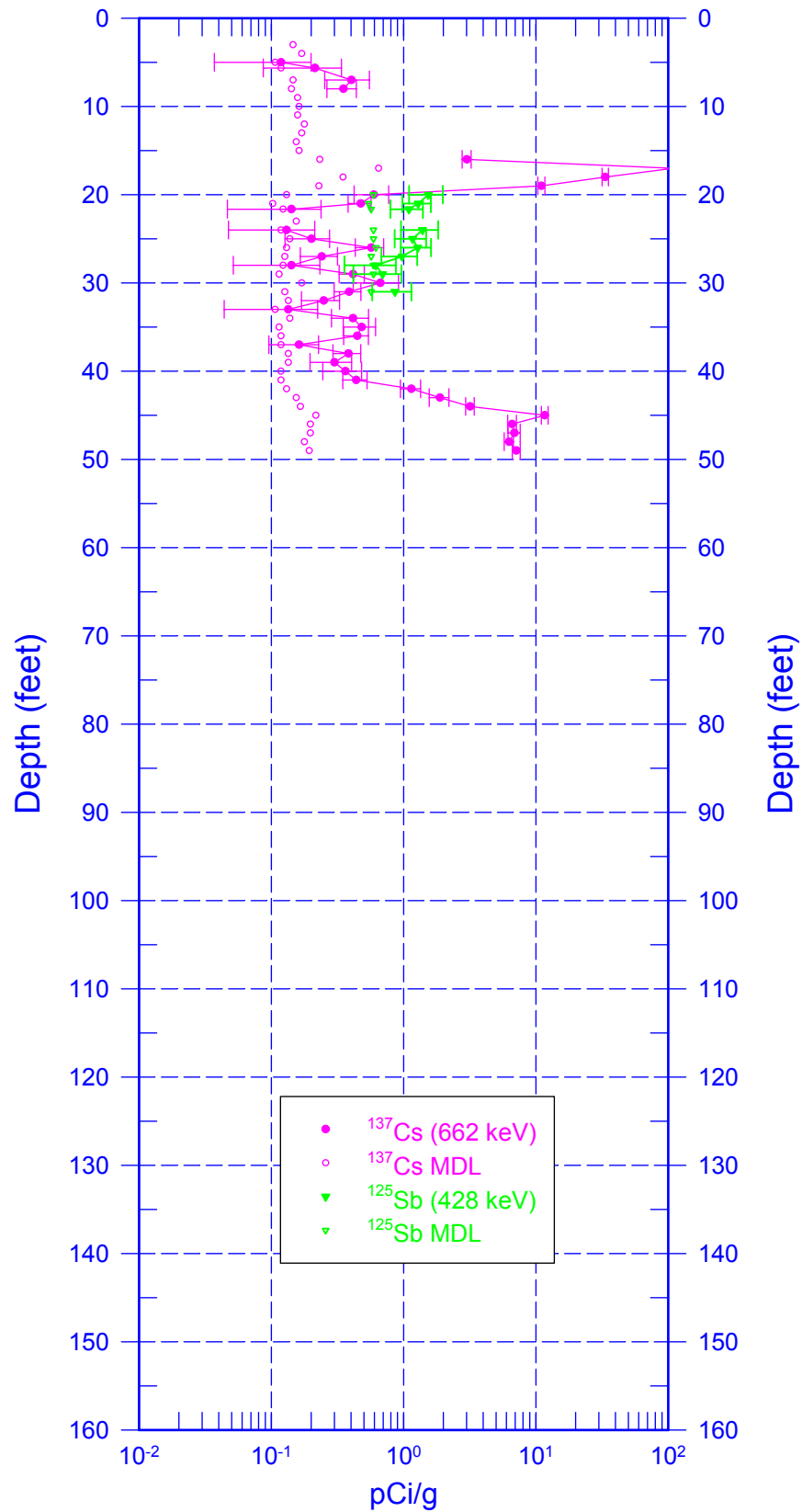
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<sup>1</sup> GWL – groundwater level

<sup>2</sup> N/A – not applicable

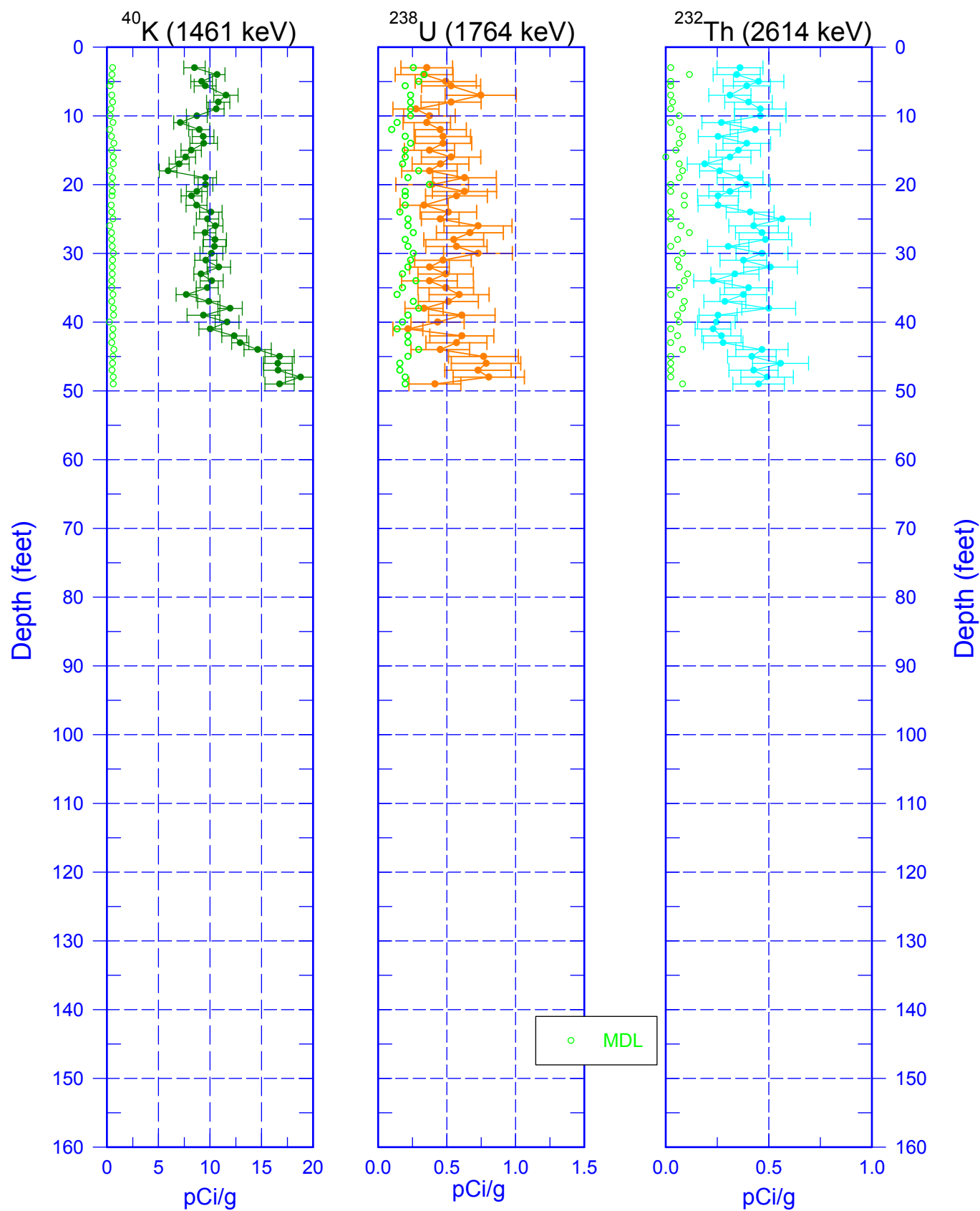
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## Man-Made Radionuclides

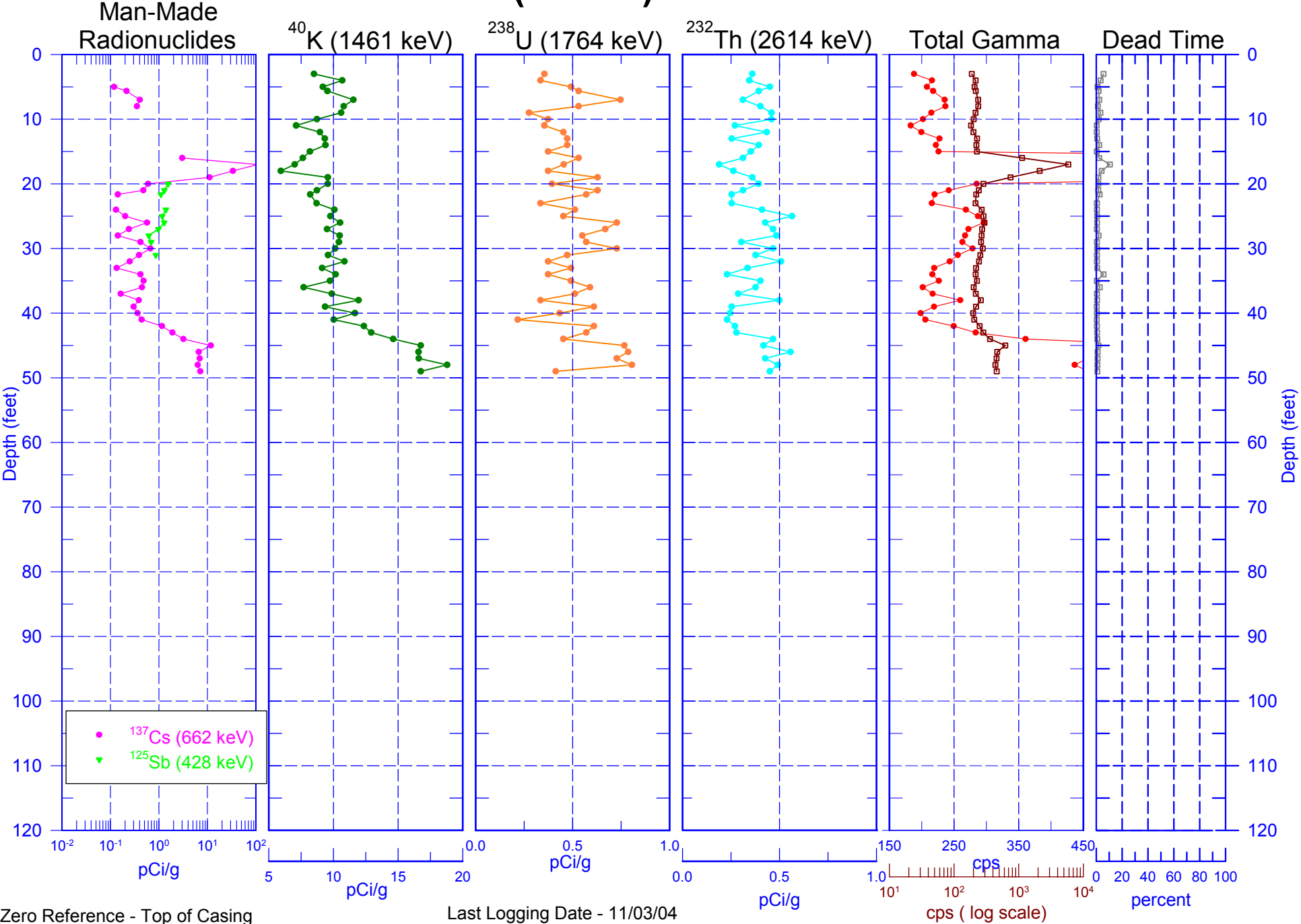


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## Natural Gamma Logs

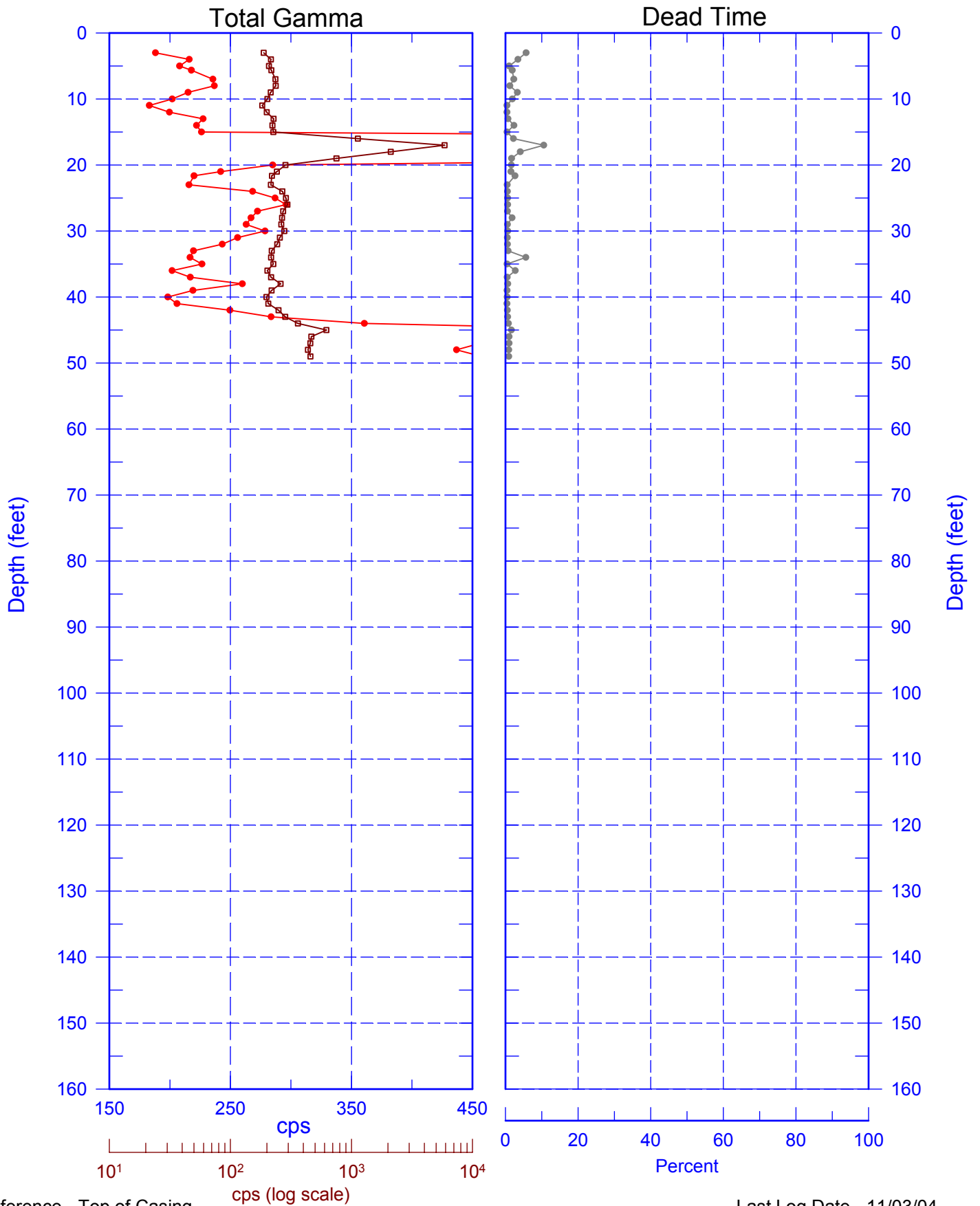


# 299-E13-56 (A5871) Combination Plot



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## Total Gamma & Dead Time

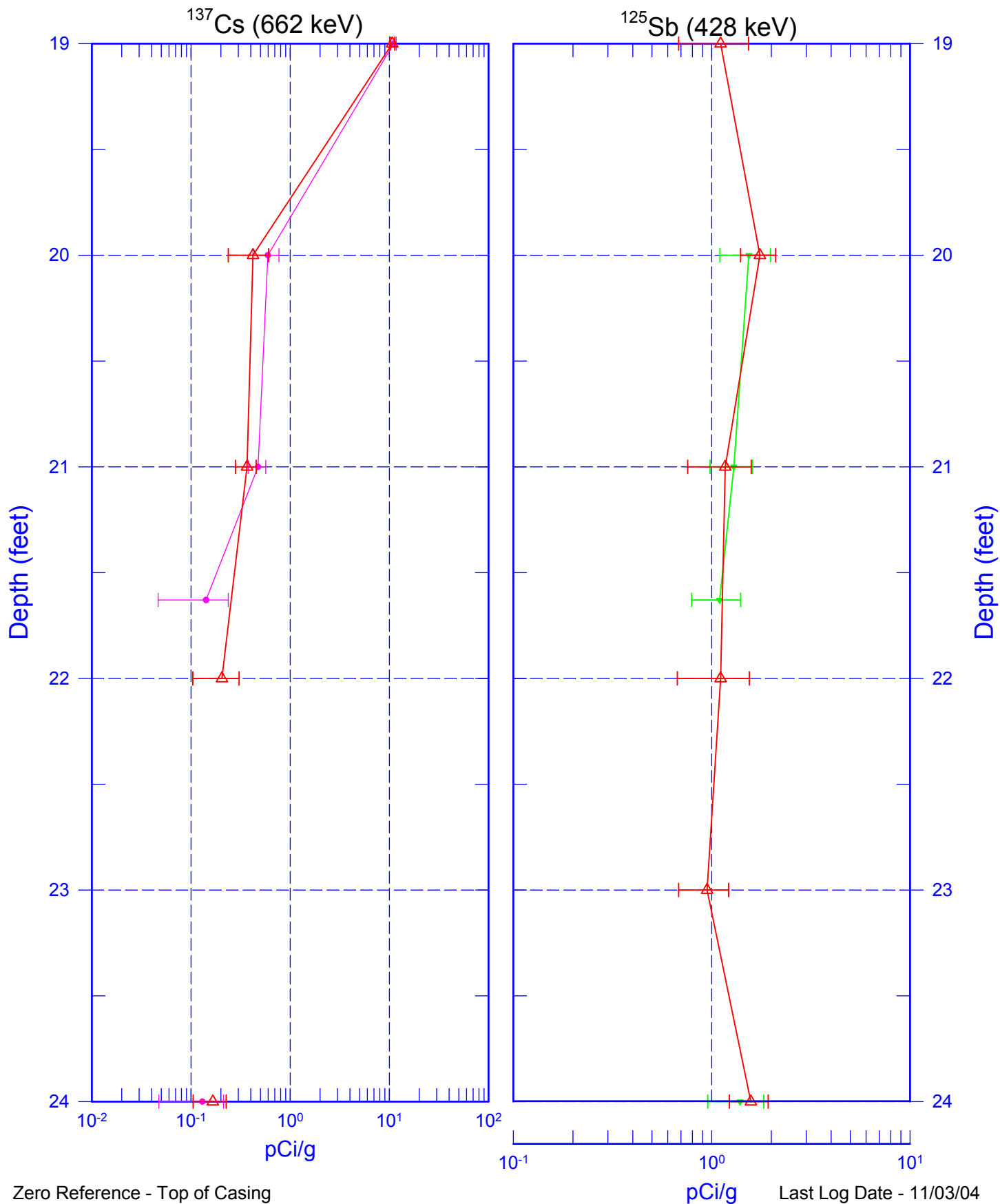


Reference - Top of Casing

Last Log Date - 11/03/04

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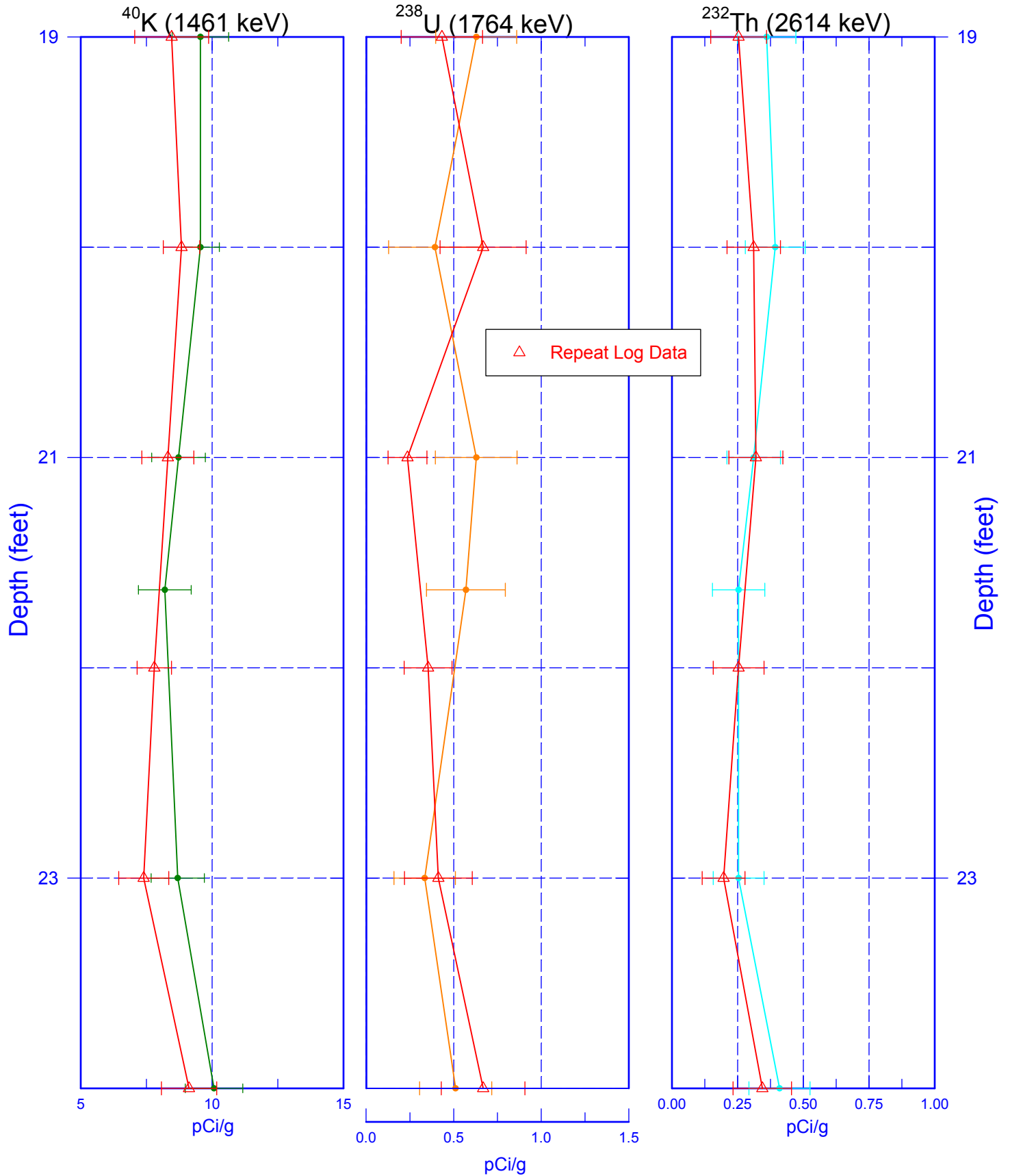
## Man-Made Repeat (19-24 ft)





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## Repeat Section of Natural Gamma Logs

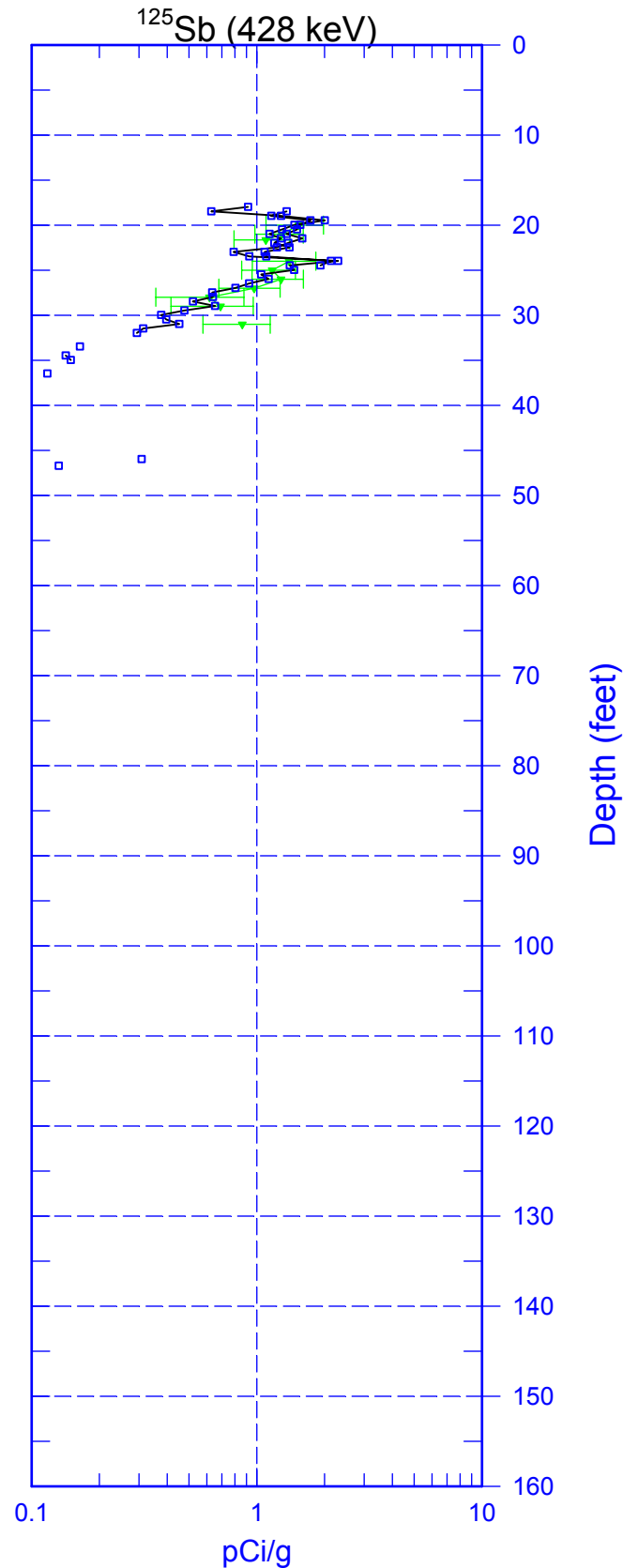
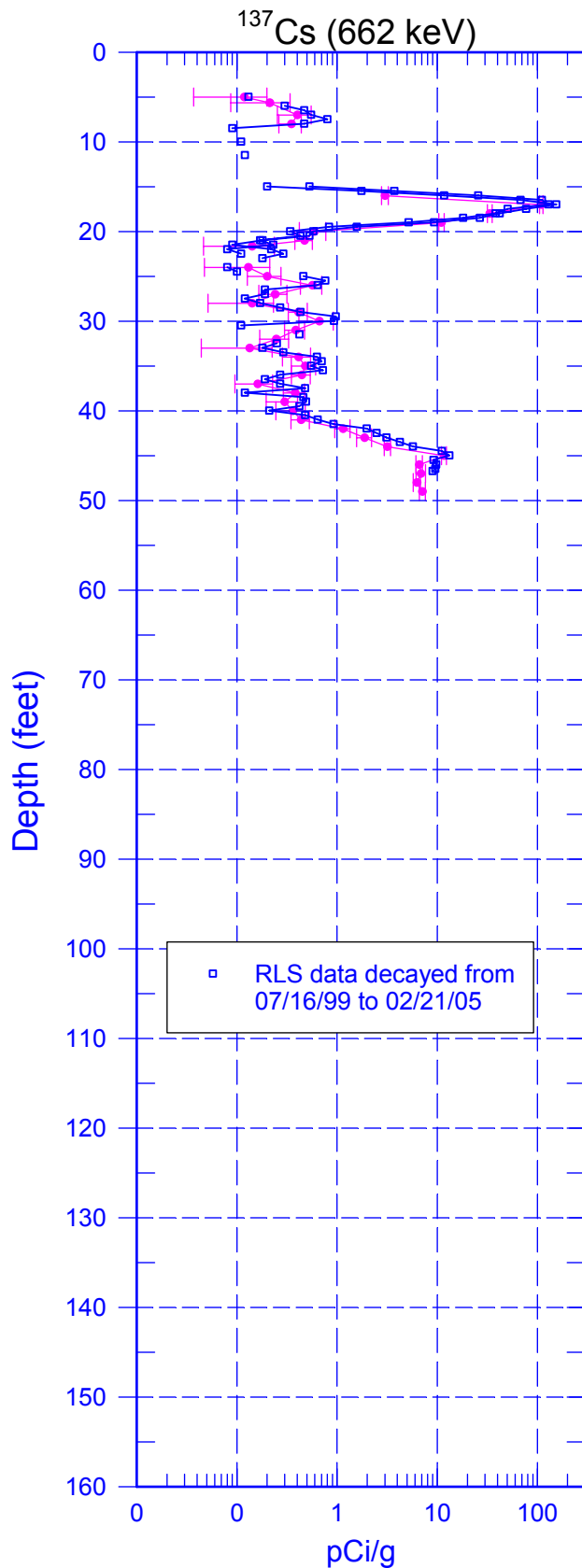


Zero Reference - Top of Casing

Last Log Date - 11/03/04

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## Natural Gamma Logs



Zero Reference = Top of Casing

Last Log Date - 11/03/04